

I claim:

1. A gripper device (4) for at least one of picking up, holding and conveying wafers (5), comprising a gripper element (13a-13c) which is arranged on a circuit board (10), the gripper element including at least one bipolar electrode pair (1) to which a voltage can be applied, and at least two gripper elements (1a-1c) being arranged on the circuit board, in which gripper elements the electrode pairs (1) are provided with an insulating layer (6) which predominantly comprises zirconium oxide.
2. The gripper device as claimed in claim 1, wherein the zirconium oxide is stabilized with yttrium oxide.
3. The gripper device as claimed in claim 1, wherein the gripper device comprises a flexible circuit board (10).
4. The gripper device as claimed in claim 1, wherein the gripper device comprises a flexible printed circuit board (10).
5. The gripper device as claimed in claim 1, wherein the electrode pairs (Figs. 1, 2) are at least one of round, and rectangular and finger-shaped.
6. The gripper device as claimed in claim 5, wherein in each case one pole (2) surrounds the other pole.
7. The gripper device as claimed in claim 1, wherein the gripper device can be operated with a DC voltage of at least one of less than 900 V and 600 V and 300 V.
8. The gripper device as claimed in claim 1, wherein when a component is being put down, an AC voltage can be applied shortly beforehand by grounding.

9. The gripper device as claimed in claim 1, wherein the electrode pairs (1a-1c) are arranged at a distance from each other, which is such that the wafer (5) can be lifted at its edges.
10. The gripper device as claimed in claim 1, wherein at least three electrode pairs (1a-1c) are arranged on a circular path.
11. The gripper device as claimed in claim 10, wherein three electrode pairs (1a-1c) are arranged at approximately 120° angles around the wafer.
12. A process for producing an electrostatic gripper comprising one or more bipolar electrodes, comprising the steps of:
 - applying the electrode pairs to a flexible circuit board (10);
 - applying a mediation layer to the electrodes (1, 1a-1c);
 - applying a zirconium oxide layer (6) to the mediation layer;
 - applying an insulating layer (8) to the other side of the electrode; and
 - pressing the layer assembly.
13. The process as claimed in claim 12, wherein at least one of indium and nickel is applied as mediation layer.
14. The process as claimed in claim 12, wherein the insulating layer is adhesively bonded before the pressing operation.
15. The process as claimed in claim 12, wherein an insulating layer (8) that is coated with adhesive is used.
16. The process as claimed in claim 12, wherein aluminum (III) oxide is used as insulating layer (8).
17. The process as claimed in claim 12, wherein first the electrodes are applied to a further flexible circuit board and are then applied to the flexible circuit board.